

A NEW BRUCHOPHAGUS FROM A LILIACEOUS PLANT
WITH A HOST PLANT LIST FOR THE GENUS
(HYMENOPTERA, EURYTOMIDAE)

B. D. BURKS, *Entomology Research Division, Agricultural Research Service,
United States Department of Agriculture*

The genus *Bruchophagus* Ashmead was originally described without included species (1888, Ent. Amer. 4:42). Six years later Ashmead (1894, Trans. Amer. Ent. Soc. 21:328) referred three species to it. Two of these, *borealis* Ashmead and *mexicanus* Ashmead, were said to have been bred from *Bruchus* and the third, *funcebris* (Howard), from the clover-seed midge. Shortly thereafter Hopkins (1896, U. S. Dept. Agr., Div. Ent. Bul. 6(n.s.), p. 73) studied *funcebris* carefully and showed that it was not a parasite of the clover-seed midge, as stated by Howard when he described it, but developed by feeding in the clover seeds themselves.

Ashmead was unwilling to accept the judgment of either Howard or Hopkins about the host relationships of *funcebris*. His final remarks on the subject (1904, Mem. Carnegie Mus. 1:260) were that he thought "that both Drs. Howard and Hopkins are wrong and that *Bruchophagus funcebris* is a parasite upon some *Bruchus*, or the larva of a small rhynchophorus beetle living in the clover seed." The same year Titus (1904, U. S. Dept. Agr., Div. Ent. Bul. 44, pp. 77-80) published his observations on the life history and habits of *funcebris*, and these left no doubt that it was a phytophagous species. He concluded that "the clover-seed chalcis-fly, if ever a coleopterous parasite, has changed its diet." Since that time no one has seriously questioned the fact that this species is phytophagous, and it has been reared from the seeds of a large number of different leguminous plants.

During the 53 years since 1904, additional species of *Bruchophagus* have been described from the seeds of leguminous plants, so that now there are 15 species which are known to develop in leguminous seeds. Also, rearings have shown that *B. mexicanus*, thought by Ashmead to be parasitic on species of *Bruchus*, actually develops in the seeds of *Astragalus*, another legume. The generic name *Bruchophagus* (despite its unfortunate derivation) has thus come to be associated by entomologists with the phytophagous habit in the seeds of legumes.

In 1952, however, Nikolskaja (Fauna U. S. S. R. 44, p. 174) described a species of *Bruchophagus* which infests the seeds of a *Primula*, in the Primulaceae. The present paper describes a species from the seeds of *Aloe*, in the Liliaceae, and further extends the range of plant families known to be attacked by members of the genus *Bruchophagus*. A host-plant list for the species of *Bruchophagus* is given at the end of this paper.

Bruchophagus aloineae, new species

Female.—Length 1.2-2.0 mm. Head and body black, anterior face of pronotum with a white spot on either side; antennae black; wings hyaline with tan or yellow venation; legs black or very dark brown with inner surface of fore tibia,

apices of all femora, bases and apices of tibiae, and basal 4 segments of each tarsus tan. Setae of head, body, and appendages silvery, inconspicuous.

Head, fig. 1, with a very vaguely defined transverse depression extending across frons just dorsal to level of ventral margins of compound eyes, area below this depression with strong striae converging toward mouth opening, dorsad of this depression the surface area of fronto-vertex with umbilicate punctation; malar furrow wanting; width of malar space two-thirds as great as height of compound eye; length of ocellar line one-third as great as postocellar line; antenna, fig. 2, with scape three times as long as pedicel, first funicle segment one-fourth longer than pedicel, second to fifth funicle segments equal in length and each as long as pedicel, club three and one-half times as long as fifth funicle segment.

Dorsal surface of pronotum, mesoscutum, and mesoscutellum with umbilicate punctation made up of well-marked, closely set, shallow pits, interstices between punctures narrow—always much less than width of punctures themselves—and almost or quite smooth; anterior face of fore coxa smooth, a broad groove extending from inner apical angle to outer basal angle; depression on anterior face of mesepisternum, into which the anterior coxa fits when at rest, with its surface closely shagreened, lateral margin carinate; prepectus relatively narrow, usually with a large, triangular pit anteriorly, this pit occasionally divided by a septum; tegula inflated, its dorsal surface very obscurely sculptured; submarginal vein of forewing five times as long as marginal vein; stigmal, postmarginal, and marginal veins equal in length; dorsal area of mesepimeron posterior to femoral furrow with numerous, closely set, longitudinal ridges, these sometimes rather irregular, but usually almost or quite parallel; outer, dorsal surface of hind coxa shagreened.

Propodeum with its surface flat and lying at a 90° angle with longitudinal axis of thorax; median area of propodeum uniformly shagreened, laterally and dorsally coarsely rugulose. Petiole as broad as long. Gaster one and one-fourth times as long as thorax; basal four gastral tergites subequal in length dorsally when gaster is in normal position; fifth gastral tergite usually completely retracted beneath fourth, sixth gastral tergite half as long as third; gastral tergites one to four smooth and asetose, fifth setose ventrally, sixth and epipygium densely setose; ovipositor sheaths directed obliquely dorsad, their apices normally exerted for a distance equal to length of sixth tergite.

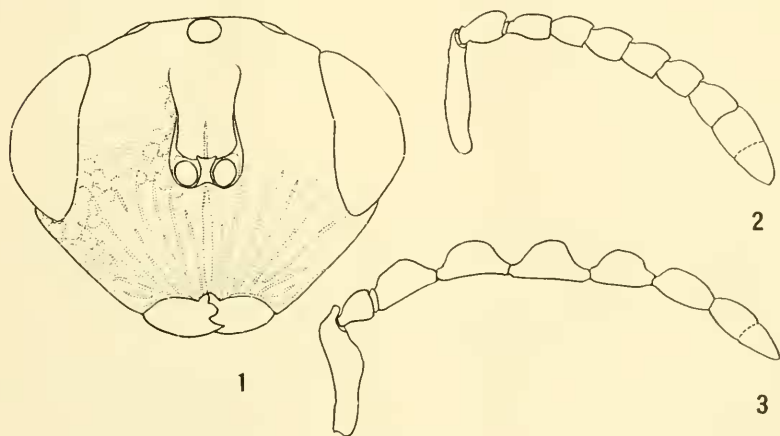
Male.—Length 1.1-2.0 mm. Apical two-thirds of fore femur, entire fore tibia, and apical third of mid femur tan. Antenna, fig. 3, with scape enlarged and three and one-half times as long as pedicel, first and second funicle segments equal in length and each twice as long as pedicel, third and fourth funicle segments equal in length and each half as long as scape, fifth segment seven-eighths as long as fourth, club three-fourths as long as scape. Petiole three times as long as wide. Gaster one-half to two-thirds as long as thorax.

Type locality.—Port Elizabeth, South Africa.

Types.—U. S. N. M. No. 63412.

Described from 21 female and 18 male specimens, all intercepted in quarantine at Washington, D. C. The specimens were taken from sealed packages of seeds being shipped into the United States for propagation purposes; the dates given are those of the interceptions. Female holotype, male allotype, and 1 male paratype, Port Elizabeth,

S. Africa, Oct. 24, 1934, with seeds of *Aloe ferox*, B. P. Q. No. 030955; 8 female and 7 male paratypes, same data, but with seeds of *Aloe lineata*, B. P. Q. No. 030956; 2 female and 1 male paratypes, same data, but with seeds of *Aloe africana*, B. P. Q. No. 030953; 1 female and 2 male paratypes, Kimberley, S. Africa, Nov. 27, 1934, with seeds of *Aloe globuligemma*, B. P. Q. No. 032536; 1 female paratype, S. Africa, Jan. 10, 1936, reared from seeds of *Aloe (Haworthia) ferox*, E. Q. Washington No. A33710; 1 female paratype, S. Africa, June 4, 1935, with seeds of *Aloe globuligemma*, B. P. Q. Washington No. 036379; 4 female and 1 male paratypes, Germany, Nov. 6, 1934, in *Aloe* sp. seeds, B. P. Q. No. A28173; 3 female paratypes, Germany, Oct. 8, 1934, with seeds of *Aloe variegata*, P. Q. No. A27779; 3 male paratypes, Potsdam, Germany, May 8, 1933, with seeds of *Aloe variegata*, B. P. Q. No. A22270.



Bruchophagus aloineae, n. sp.: Fig. 1, Anterior aspect of head of female; fig. 2, antenna of female; fig. 3, antenna of male.

In addition there are more or less fragmentary specimens of this species, not included in the type series, in the U. S. N. M. collection from the following localities and hosts: Port Elizabeth, S. Africa, seeds of *Aloe striata*, *Aloe (Haworthia) ferox*, *Aloe africana*, *Aloe microstigma*, and *Aloe lineata*; Ethiopia, seeds of *Aloe* sp.; Germany, seeds of *Aloe variegata* and *Aloe* sp.

Bruchophagus aloineae differs from *B. gibbus* (Boheman) in having the dorsal pronotal punctures uniformly close together, with narrow, unsculptured interstices; in *gibbus* these punctures are rather haphazardly arranged, with some of the interstices as wide as the punctures themselves, and the surfaces of the interstices are shagreened. *B. aloineae* differs from *B. mexicanus* Ashmead in possessing strong striae on the lower face; this area is umbilicately punctate in *mexicanus*. The black antennal scape and mostly black anterior and mid legs of the female of *aloineae* distinguish it from *B. borealis*

Ashmead, as the antennal scape and two anterior pairs of legs in *borcalis* are almost entirely yellow.

HOST-PLANT LIST FOR BRUCHOPHAGUS

The following list has been compiled from data associated with identified specimens of *Bruchophagus* in the collection of the U. S. National Museum and from the literature reference files maintained there by the Insect Identification and Parasite Introduction Laboratories, U. S. Department of Agriculture. The plant names were kindly checked by Dr. Velva E. Rudd, Division of Botany, U. S. National Museum.

LEGUMINOSAE	SPECIES OF BRUCHOPHAGUS
<i>Astragalus macronyx</i>	<i>macronycis</i> Fedoseeva
<i>Astragalus mollissimus</i> , loco weed	<i>mexicanus</i> Ashmead
<i>Astragalus</i> sp.	<i>gibbus</i> (Boheman)
	<i>astragali</i> Fedoseeva ¹
<i>Cajanus cajan</i> , pigeon pea	<i>mellipes</i> Gahan
<i>Caragana arborescens</i> , pea tree	<i>caraganae</i> (Nikolskaja)
<i>Caragana frutescens</i>	<i>caraganae</i> (Nikolskaja)
<i>Caragana pygmaea</i>	<i>caraganae</i> (Nikolskaja)
<i>Colutea arborescens</i> , bladder senna	<i>colutae</i> (Bouček)
<i>Colutea media</i>	<i>colutae</i> Fedoseeva ²
<i>Glycyrrhiza glabra</i> , licorice	<i>glycyrrhizae</i> Nikolskaja
<i>Hedysarum sibiricum</i>	<i>hedysari</i> Fedoseeva
<i>Indigofera</i> sp., indigo	<i>indigoferae</i> (Risbee)
<i>Lespedeza</i> sp., bush clover	<i>gibbus</i> (Boheman)
<i>Lotus corniculatus</i> , birds-foot trefoil	<i>gibbus</i> (Boheman)
	<i>kolobovae</i> Fedoseeva
<i>Lotus decumbens</i>	<i>gibbus</i> (Boheman)
<i>Medicago arabica</i> , spotted bur clover	<i>gibbus</i> (Boheman)
<i>Medicago falcata</i>	<i>gibbus</i> (Boheman)
<i>Medicago hispida</i> , toothed bur clover	<i>gibbus</i> (Boheman)
<i>Medicago ruthemia</i>	<i>gibbus</i> (Boheman)
<i>Medicago sativa</i> , alfalfa	<i>gibbus</i> (Boheman)
	<i>roddi</i> Gussakovsky
<i>Medicago tornata</i>	<i>gibbus</i> (Boheman)
<i>Medicago tuberculata</i>	<i>gibbus</i> (Boheman)
<i>Medicago tunetana</i>	<i>gibbus</i> (Boheman)
<i>Melilotus</i> sp., sweetclover	<i>gibbus</i> (Boheman)
<i>Onobrychis capulgalli</i>	<i>onobrychidis</i> (Nikolskaja)
<i>Onobrychis viciaefolia</i> (= <i>sativa</i>), Sainfoin	<i>onobrychidis</i> (Nikolskaja)
<i>Ononis</i> sp., rest harrow	<i>ononis</i> (Mayr)
<i>Oxytropis lambertii</i> , loco weed	<i>gibbus</i> (Boheman)

¹I am indebted to Dr. O. Peck, Canadian Department of Agriculture, for the reference to the original description of this species—Fedoseeva, 1954, Vestnik, Moscow Univ., 9, No. 5, p. 115.

²This species is a homonym, and probably also a synonym, of *B. colutae* (Bouček).

<i>Sesbania sesban</i>	<i>mellipes</i> Gahan
<i>Sesbania grandiflora</i>	<i>mellipes</i> Gahan
<i>Smirnovia turkestanica</i>	<i>smirnoviae</i> Nikolskaja
<i>Sophora japonica</i> , Japanese pagoda tree	<i>sophorae</i> Crosby
<i>Trifolium incarnatum</i> , crimson clover	<i>gibbus</i> (Boheman)
<i>Trifolium pratense</i> , red clover	<i>gibbus</i> (Boheman)
<i>Trigonella</i> sp.	<i>gibbus</i> (Boheman)

PRIMULACEAE

<i>Primula</i> sp., primrose	<i>mutabilis</i> Nikolskaja
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LILIACEAE

<i>Aloe africana</i>	<i>aloineae</i> Burks
<i>Aloe ferox</i>	<i>aloineae</i> Burks
<i>Aloe globaligemma</i>	<i>aloineae</i> Burks
<i>Aloe lineata</i>	<i>aloineae</i> Burks
<i>Aloe microstigma</i>	<i>aloineae</i> Burks
<i>Aloe striata</i>	<i>aloineae</i> Burks
<i>Aloe variegata</i>	<i>aloineae</i> Burks

A total of 32 species have been referred to the genus *Bruchophagus*. In addition to those listed above as phytophagous, the following species have been reared from cynipid galls: *B. cynipseus* (Boheman), *jaccae* (Mayr), *phanacidis* (Mayr), *setigerus* (Mayr), and *timaspidis* (Mayr). There are six species of unknown habits: *B. cylindricus* (Thomson), *inconspicuus* Girault, *maurus* (Boheman), *niger* Girault, *noctua* Girault, and *sculpta* (Ashmead). Three others still are said to parasitize Bruchidae: *B. borealis* Ashmead, *bruchocida* (Risbee), and *sayeli* (Risbee).

Bruchophagus sativae Ashmead, Tschorbadjiev (1936, Mitt. Bulgar. Ent. Ges. 9: 169) evidently is a *nomen nudum*. Although this author credits the specific name to Ashmead, there is no record that Ashmead described such a species. If *sativae* were taken to have been validated by the very meager information given by Tschorbadjiev, the name should be attributed to him.

Eurytoma acaciae Cameron (1910, The Ent. 43: 114) [not *E. acaciae* Girault, 1914 nor *E. acaciae* Risbee, 1951], reared from the seeds of *Acacia decurrens* in New Zealand, possibly is a *Bruchophagus*. I have been unable to locate the type.